

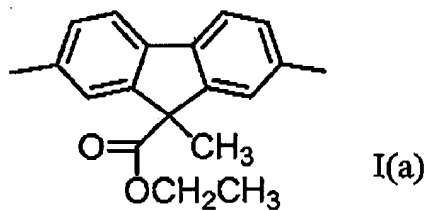
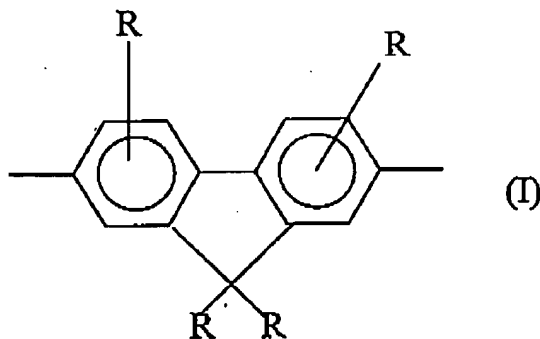
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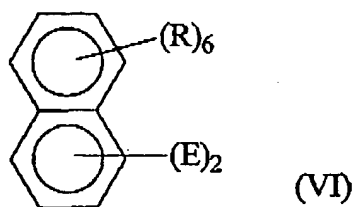
Listing of Claims

JAN 16 2007

1. (Currently amended) A copolymer comprising at least one first monomeric unit and at least one second monomeric unit, wherein the at least one first monomeric unit has a formula selected from the group consisting of Formula I and I(a)



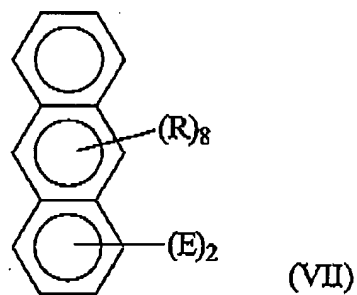
and the at least one second monomeric unit is selected from fused ring aromatic groups having Formula VI,



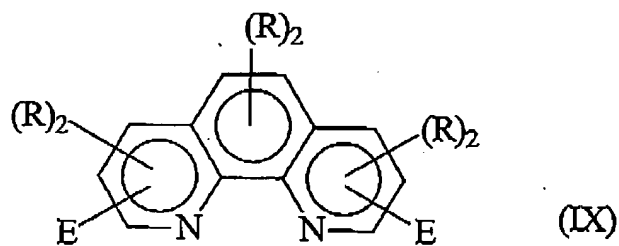
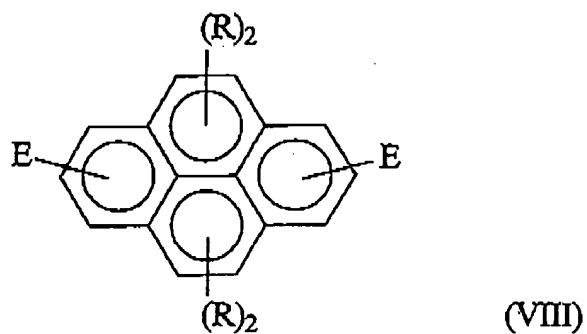
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Formula VII,

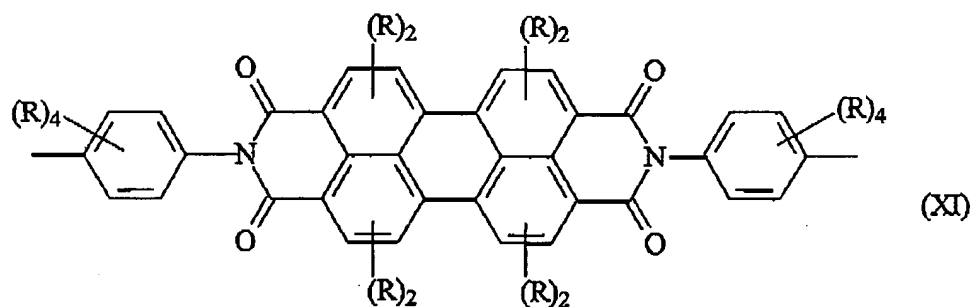
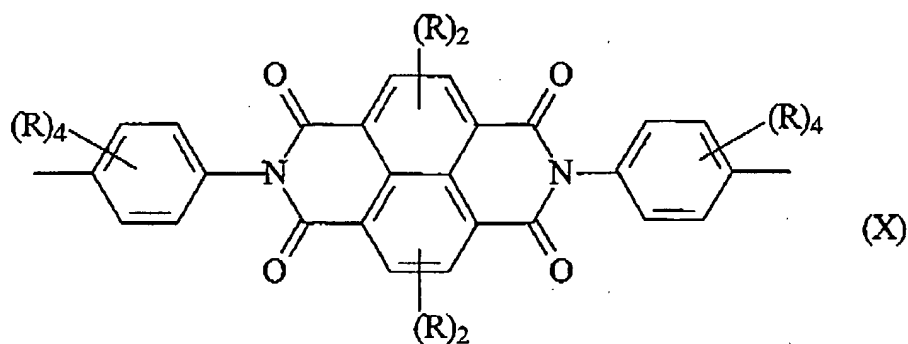


and Formula VIII



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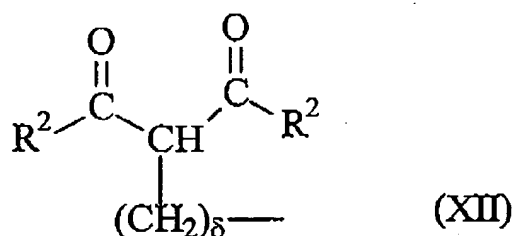


where:

in each of Formulae I, I(a), VI, VII, and VIII:

R is a substituent on a carbon atom which can be the same or different at each occurrence and is selected from hydrogen, alkyl, aryl, heteroalkyl, heteroaryl, F, -CN, -OR¹, -CO₂R¹, -C_ψH_θF_λ, -OC_ψH_θF_λ, -SR¹, -N(R¹)₂, -P(R¹)₂, -SOR¹, -SO₂R¹, -NO₂, and beta-dicarbonyls having Formula XII

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wherein

R^2 is selected from hydrogen, alkyl, aryl, heteroalkyl and heteroaryl;

δ is 0 or an integer from 1 to 12, adjacent R groups together can form a single 5- or 6-membered cycloalkyl, aryl, or heteroaryl ring,

such that:

R^1 is a substituent on a heteroatom which can be the same or different at each occurrence and is selected from alkyl, aryl, heteroalkyl and heteroaryl provided that when adjacent R groups form a ring, R^1 cannot be aryl or heteroaryl; and

ψ is an integer between 1 and 20, and θ and λ are integers satisfying Equation A1 below:

$$\theta + \lambda = 2\psi + 1; \quad (\text{Equation A1});$$

in each of Formulae VI, VII, and VIII:

E can be the same or different at each occurrence and is a single bond or a linking group selected from arylene and heteroarylene;

in Formula VI;

the two E's are in the 1,4-, 1,5-, 1,8-, 2,3-, or 2,6- positions;

in Formula VII;

the two E's are in the 1,4-, 1,5-, 1,8-, 2,3-, 2,6-, or 9,10- positions;

in Formula VIII;

a first E is in the 1, 2, or 3 position, a second E is in the 6, 7, or 8 position;

and

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with the proviso that when R in formulae VI, VII, and VIII is hydrogen, alkyl, F, -CN, -OR¹, or CO₂R¹ the copolymer further comprises end-capping groups that are aromatic;
and with the further proviso that said copolymer does not consist of 9,9-di-n-octylfluorene and unsubstituted naphthalene alternating copolymer.

2. (Original) The copolymer of Claim 1, wherein R groups in one or more of the at least one first monomeric unit are independently selected from alkyl groups having 1 to 30 carbon atoms; heteroalkyl groups having 1-30 carbon atoms and one or more heteroatoms of S, N, or O; aryl groups having from 6 to 20 carbon atoms, and heteroaryl groups having from 2 to 20 carbon atoms and one or more heteroatoms of S, N, or O.

3. (Original) The copolymer of Claim 1 that excludes any vinylene monomeric units.

4. (Previously Presented) The copolymer of Claim 1 wherein each R group in each of Formula I, Formula 1(a), Formula VI, Formula VII, and Formula VIII is selected from:

hydrogen;

alkyl;

aryl;

heteroalkyl;

heteroaryl;

F;

-CN;

-P(R¹)₂ and -SOR¹, where R¹ is a substituent on a heteroatom which can be the same or different at each occurrence and is selected from alkyl, aryl, heteroalkyl and heteroaryl;

-NO₂;

a beta-dicarbonyl having Formula XII;

-C_ψH_θF_λ;

-OC_ψH_θF_λ;

-OR¹, -CO₂R¹, -SR¹, -N(R¹)₂, and -SO₂R¹ where R¹ is a straight chain or branched alkyl of more than 20 carbons or a straight chain or branched heteroalkyl.

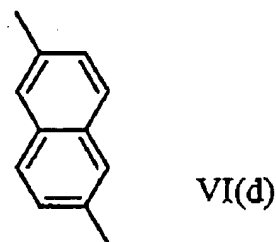
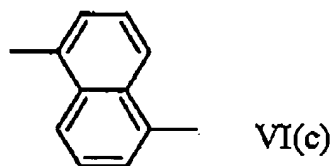
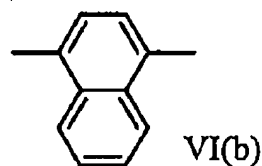
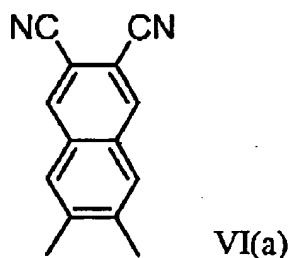
5. (Original) The copolymer of Claim 1 wherein the at least one of the R groups in one or more of the at least one first monomeric unit is independently selected from linear and

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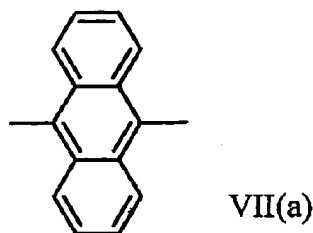
branched n-butyl groups; linear and branched iso-butyl groups; linear and branched pentyl groups; hexyl groups, and octyl groups with and without olefinic unsaturation; phenyl groups, thiophene groups, carbazole groups, alkoxy groups, phenoxy groups and cyano groups.

6. (Original) The copolymer of Claim 1 wherein at least one of the R groups in one or more of the at least one first monomeric unit are independently selected from H, C₆-C₁₂ alkoxy, phenoxy, C₆-C₁₂ alkyl, phenyl and cyano.

7. (Previously Presented) The copolymer of Claim 1 wherein one or more of the at least one second monomeric unit is selected from Formulae VI(a) through VI(d), and VII(a)



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8. (Cancelled).

9. (Previously Presented) The copolymer of Claim 1, wherein one or more of the at least one second monomeric unit has Formula VI, VII and VIII: wherein R is selected from:

partially or fully fluorinated alkyl groups having from 1 to 12 carbon atoms;

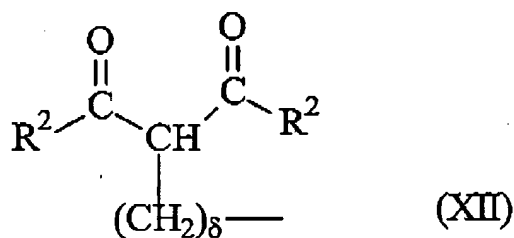
alkoxy groups having from 1 to 12 carbon atoms;

esters having from 3 to 15 carbon atoms;

$-SR^1$, $-N(R^1)_2$, $-P(R^1)_2$, $-SOR^1$, $-SO_2R^1$, where R^1 is an alkyl group having from 1 to 12 carbon atoms;

$-NO_2$; and

beta-dicarbonyls having Formula XII



where:

in Formula XII:

R^2 is an alkyl group having from 1 to 12 carbon atoms and δ is 0, 1, or 2.

10-12. (Cancelled).

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13. (Previously Presented) The copolymer of Claim 1, wherein one or more of the at least one second monomeric unit has one of Formulae VI through VIII wherein:

R groups are H, C₆-C₁₂ alkyl groups, C₆-C₂₀ aryl groups, and C₂-C₂₀ heteroaryl groups;
and

in Formula VI:

the E's are in the 1,4-, 1,5-, 1,8-, 2,3-, or 2,6- positions;

in Formula VII:

the E's are in the 1,4-, 1,5-, 1,8-, 2,3-, 2,6-, or 9,10- positions.

14. (Original) An electronic device comprising at least one electroactive layer comprising the copolymer of Claim 1.

15. (Original) The device of Claim 14, wherein the device comprises a hole injection/transport layer comprising the copolymer of Claim 1.

16. (Original) The device of Claim 14, wherein the device comprises an electron injection/transport layer comprising the copolymer of Claim 1.

17. (Original) The device of Claim 14, wherein the electroactive layer comprises a light-emitting material comprising the copolymer of Claim 1.

18. (Cancelled).

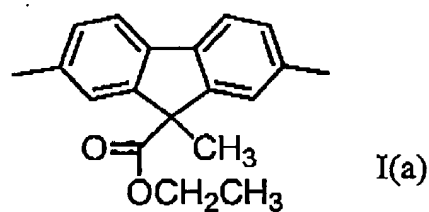
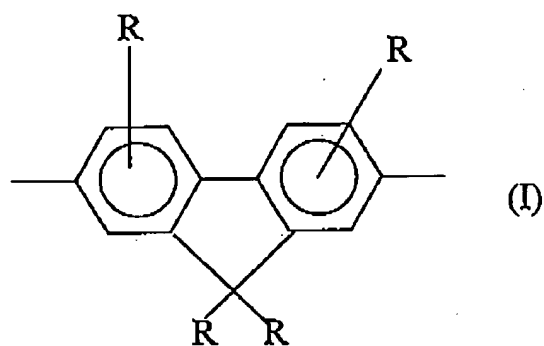
19. (Original) The device of Claim 14, wherein the device is selected from a light-emitting device, a photodetector, and a photovoltaic device.

20. (Original) The device of Claim 14, wherein the device is an electroluminescent display.

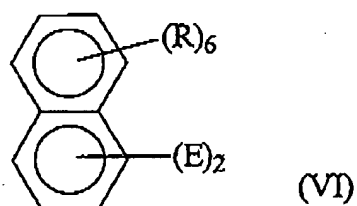
21. (Currently Amended) A light-emitting device comprising at least one light-emitting layer comprising the copolymer of formula

at least one first monomeric unit and at least one second monomeric unit, wherein the at least one first monomeric unit has a formula selected from the group consisting of Formula I and I(a)

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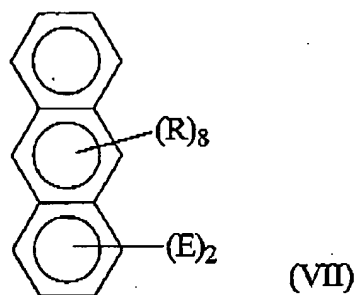


and the at least one second monomeric unit is selected from fused ring aromatic groups having Formula VI,

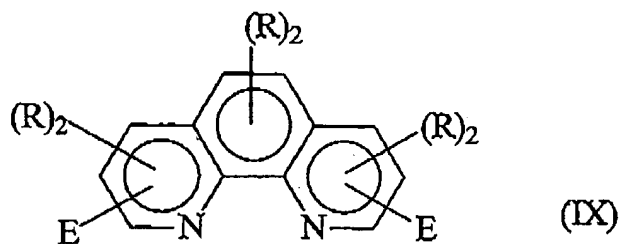
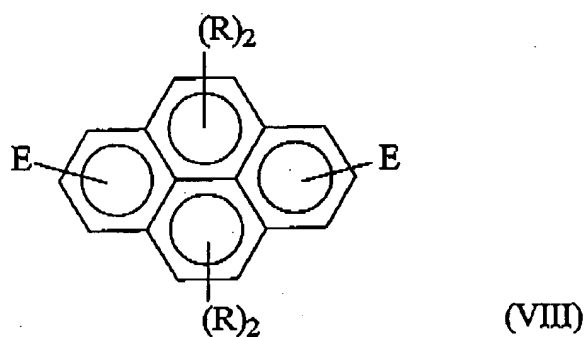


Formula VII,

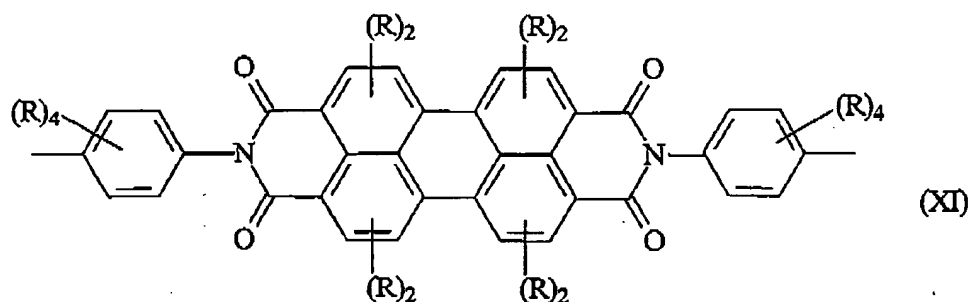
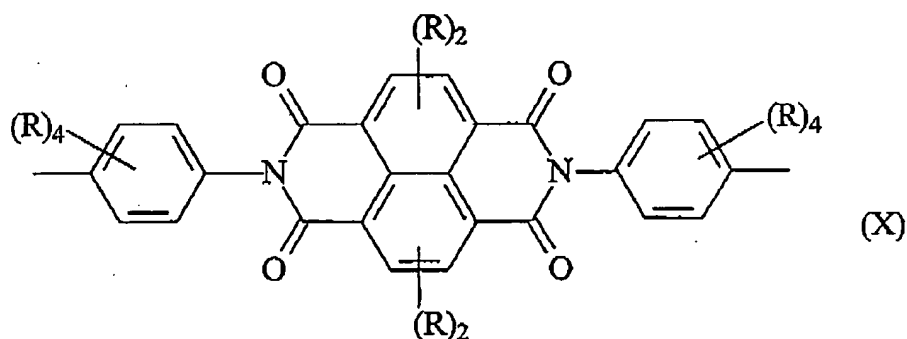
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and Formula VIII through Formula XI,



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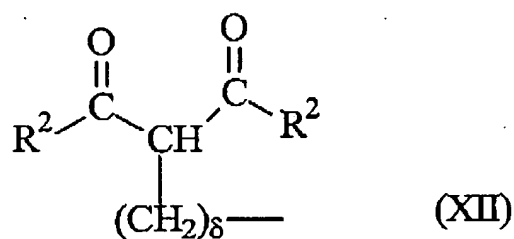


where:

in each of Formulae I, I(a), VI, VII, VIII through XI:

R is a substituent on a carbon atom which can be the same or different at each occurrence and is selected from hydrogen, alkyl, aryl, heteroalkyl, heteroaryl, F, -CN, -OR¹, -CO₂R¹, -C_ψH_θF_λ, -OC_ψH_θF_λ, -SR¹, -N(R¹)₂, -P(R¹)₂, -SOR¹, -SO₂R¹, -NO₂, and beta-dicarbonyls having Formula XII

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wherein

R^2 is selected from hydrogen, alkyl, aryl, heteroalkyl and heteroaryl;

δ is 0 or an integer from 1 to 12 and adjacent R groups together can form a single 5- or 6-membered cycloalkyl, aryl, or heteroaryl ring,

such that:

R^1 is a substituent on a heteroatom which can be the same or different at each occurrence and is selected from alkyl, aryl, heteroalkyl and heteroaryl provided that when adjacent R groups form a ring, R^1 cannot be aryl or heteroaryl; and

ψ is an integer between 1 and 20, and θ and λ are integers satisfying Equation A1 below:

$$\theta + \lambda = 2\psi + 1; \quad (\text{Equation A1});$$

in each of Formulae VI, VII, VIII, and IX:

E can be the same or different at each occurrence and is a single bond or a linking group selected from arylene and heteroarylene;

in Formula VI:

the two E's are in the 1,4-, 1,5-, 1,8-, 2,3-, or 2,6- positions;

in Formula VII;

the two E's are in the 1,4-, 1,5-, 1,8-, 2,3-, 2,6-, or 9,10- positions;

in Formula VIII;

a first E is in the 1, 2, or 3 position, a second E is in the 6, 7, or 8 position;

in Formula IX; and

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a first E is in the 2, 3, or 4 position; a second E is in the 7, 8, or 9 position; and
in Formula XII;

with the proviso that said copolymer does not consist of 9,9-di-n-octylfluorene and
unsubstituted naphthalene alternating copolymer.